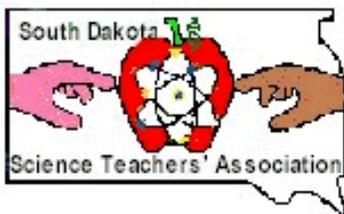


# South Dakota Science Teachers' Association



## Spring 2017



March 2017

Volume 144

Dear SDSTA Members,

It was so great seeing many of you at SDSTA early last month. I hope you've had a chance since to get out and enjoy this unseasonably warm weather – warmest it's been since I've lived in SD to be sure!

As we reflected with the joint team (Math and Science) on the 25<sup>th</sup> Conference I am pleased with the amount of support and feedback our SDSTA group is willing to provide to ensure that this conference continues to meet the needs of teachers throughout the state. We will be hosting 2018's event (my last as President) in Huron, although for the first time in ages it will not be the 1<sup>st</sup> Friday of February and will instead be Feb 8-10, 2018 – go ahead and get your rooms booked and your budget requests in ☺. We will once again be pursuing and perfecting the methods of online session submissions and registrations for the Conference. If you have never presented before, please consider doing so – this is a conference for and by teachers – we need you to continue to make it so. If you presented this year you should have received a survey link to share some feedback regarding the presentation submissions, communication about your session, and other needs you might have as a presenter – please complete this survey so that the committee can address any recommendations you have.

I hope that 2017 will be an exciting and progressive year for science and science education. Those of you who know me well know that

it is my passion to ensure that the community recognizes classroom teachers as experts and professionals in the field of inspiring and educating young people. Whatever grade you teach, whether you teach science for 1 session per week or 100% every day, please stand with confidence in yourself and your profession and represent all educators as experts in our field (the minds of elementary, middle, and high schoolers, and even young adult undergraduates, adult graduate students and lifelong learners). I hope you will join me in celebrating the wonder of science and share your passion with your communities, via your classroom, community programs and events, and even in your electronic footprint. Please don't hesitate to connect with me or the rest of the SDSTA leadership team if you ever need a quick project, a resource, a mentor, or a cheerleader in your corner as you pursue your career as science teachers. If there's ever a chance to highlight your efforts publicly, please let us know, we would love to share positive stories of what's happening in science classrooms throughout the state through social media and other media releases!

(You can email me at [liz@sdsta.org](mailto:liz@sdsta.org) or the whole team at [officers@sdsta.org](mailto:officers@sdsta.org)) for a list of the remaining officer team see this newsletter or check out the website [www.sdsta.org](http://www.sdsta.org)).

Thank you again and always for the work that you do to inspire the future generation. I hope to see you around!

~LIZ McMillan, SDSTA President 2017/18



# Congratulations to the following SDSTA Awardees from the 2017 Conference!



**Friend of Science—**Judy Vondruska—SDSU with SDSTA president Liz McMillan

**Outstanding Physical Science Teacher of the Year—**Charles Standen—Spearfish. Sponsored by 3M



**Outstanding Biology Teacher of the Year—**Tracy Moody—Sanborn Central with Julie Olson, SDSTA past-president. Sponsored by Sanford Health.



**Kelly Lane Earth and Space Science Grant—**Julie Olson (Second Chance HS), Thomas Durkin (SD Space Grant Consortium), and Patty Martin (Aberdeen Roncalli)



**Daniel Swets Robotics Award:**

Jackie Knox (Highmore Harrold Junior High), Tom Durkin (SD Space Grant), Kelly Hinds (Simmons Middle School, Aberdeen, SD), and to the right Laurie Elmore (SDSU Extension Harding County 4-H)



## Sanford Ambassadors



Ben Benson (Sanford PROMISE), Lisa Cardillo (Harrisburg), Liz McMillan (Sanford) PROMISE)



Ben Benson (Sanford PROMISE), Jeff Peterson (West Central), Liz McMillan (Sanford) PROMISE)



Ben Benson (Sanford PROMISE), Lindsay Kortan (Bon Homme), Liz McMillan (Sanford) PROMISE)

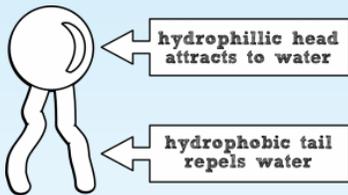


## Modeling Cell Membranes with Soap Bubbles—Julie Olson

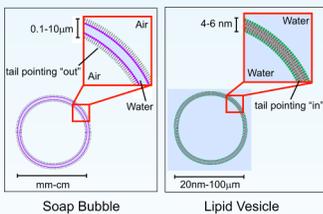
I have done this lab for many years but it has become even more important with the scientific practice of modeling as well as argumentation "Is a soap film a good model for a cell membrane?" I have seen many different lab activity write ups but the one from Jeremy Conn of Clearbiology.com has a very good diagram of the two layers in question: cell membranes and soap films.

Here is the link to download the laboratory directions and worksheet.

<http://1xn44aytb25tcj2q1g7c731a.wpengine.netdna-cdn.com/wp-content/uploads/2014/10/Cell-Membrane-Bubble-Lab.pdf>



### A Phospholipid



The above diagrams were taken from the Clear Biology websites: <http://www.clearbiology.com/>

## Discounts for all schools from Fisher Sci. Ed.

Fisher Science Education has partnered with SDPESCoR for the 2<sup>nd</sup> year in a row to increase funding for science fair school awards. Fisher Science Education will be adding to the High School Science Lab Makeover and the School Challenge Competition awards in the form of a gift certificate. In addition, **ALL** South Dakota schools purchasing through Fisher Science Education receive a 25% discount and free shipping on all orders over \$250. Discounts apply to current catalog prices only and are not applicable to sales items or special quotations. Discounts exclude products ending in ND, non-catalog items, denoted with an NC prefix and customized items. Free shipping excludes live, hazardous and motor freight items. To take advantage of the discount or with any questions, please contact your dedicated K-12 science sales representative with Fisher Science Education, Kim Wilk, at 630-259-4756 or



[kim.wilk@thermofisher.com](mailto:kim.wilk@thermofisher.com).

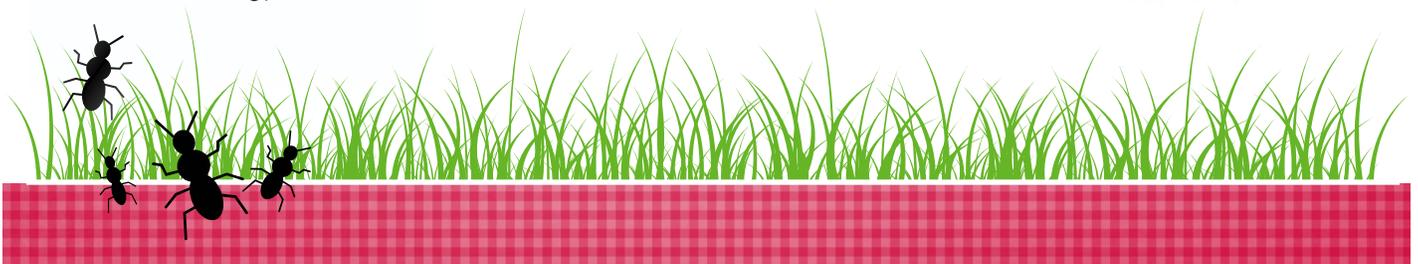
## Presidential Awards for Excellence in Math and Science Teaching—seeking nominations! -

Jennifer Fowler, PAEMST 2015

It is time to nominate a great 7-12 science teacher for the highest award for math and science teaching in the nation! The Presidential Awards for Excellence in Mathematics and Science Teaching is a White House program designed to honor superior teaching and accomplishment and is administered by the National Science Foundation.

As a 2015 Awardee, I found the application process rewarding and the benefits are still being presented to me. Each of the components allowed me the time to compile all the greatness in my classroom, and the information gathered during the reflection process has been incorporated in my subsequent lessons. I highly suggest completing an application for your own professional growth as the final product is truly something to cherish.

Submit your nomination before the April 1st deadline! Completed applications are due May 1st. (K-6 teachers should start planning for next year, as I suggest filming your lesson early!) Find your way to PAEMST.ORG to nominate a colleague, or yourself!



## Gas Phenomena—submitted by Lindsay Kortan

These demonstrations can also be great examples for drawing models. Following the demonstrations, students can be asked to determine an explanation and draw a model of how a toilet plunger works or why a pop can fizzes when opened and why it goes flat faster on the counter than in the refrigerator. The pop can example is also a good introduction to the relationship between gas solubility and temperature.

### Standards:

MS-PS1-4: Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

MS-PS3-5: Engage in argument from evidence to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

HS-PS3-2: Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motion of particles and energy associated with the relative position of particles.

### Demonstrations:

Balloon in Flask: Add a few milliliters of water to a round bottom flask. Heat the flask to boil the water. Once the water is boiling, place a balloon over the mouth and allow to cool. The greater atmospheric pressure will push the balloon into the flask. This works best if it is set up before class and shown to students for them to try and explain what is causing the balloon to stay in the flask and how it was made.

Can Crush: Heat a few milliliters of water in an empty pop can until it begins to boil. Using tongs, quickly remove the can from the heat and turn upside down in a beaker of cold water. The steam condenses which de-

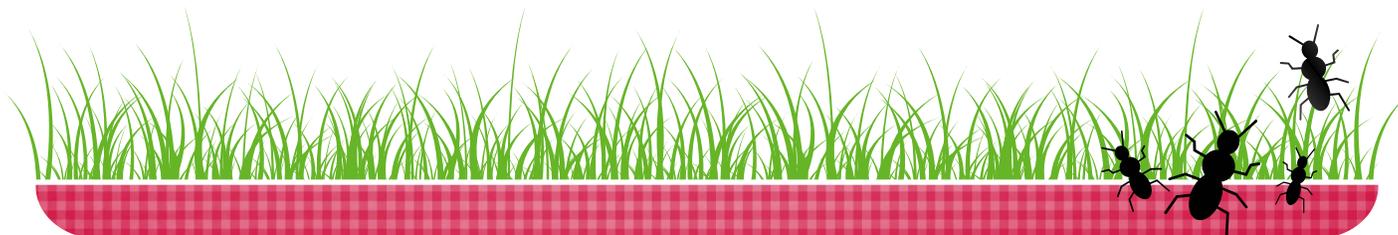
creases the gas pressure inside the can. The greater atmospheric pressure compared to the inside crushes the can. I usually follow this demonstration with the following

YouTube video of the same outcome with a train car: [https://www.youtube.com/watch?v=Zz95\\_VvTxZM](https://www.youtube.com/watch?v=Zz95_VvTxZM).

Water weight vs. Atmosphere: Fill a glass container with water. Place a card or laminated piece of paper over the opening and turn upside down, holding the card in place. Release the card. The card will be held in place by the upward force of the atmospheric pressure (and the adhesion between the card, the water, and the glass).

Water vs. Atmosphere Part 2: Repeat the previous steps, but use a wire screen in place of the card/laminated piece of paper. Hold the wire screen against the opening with your fingers, but do not cover the opening. Allow students to look up into the opening to see the water being held there. You can also use this demonstration to discuss

Cartesian Diver: Cut off the end of a plastic pipette and seal the opening of the bulb with clay, sticky tack, etc. Place into a clear plastic bottle and fill with water. Place the cap on the bottle and then squeeze. The “diver” should descend as the pressure in the bottle is increased. The gas in the bulb is compressed which decreases the volume and increases the density. If it does not descend, you will need to add more clay to



## Butterfly Curriculum—Jennifer Fowler

It's the warm spring days that get us excited to look for butterflies! Grab a pair of binoculars, head outside, and search the wildflowers that are blooming. Get started by finding the Activity/Curriculum Guide on the following website which includes an Observation Journal Page for students to gather field notes, Natural History Pages for 13 of South Dakota's Butterflies, coloring sheets, and much more! The Oahe Downstream Recreation Area has a fabulous new Prairie Butterfly Garden with beautiful native plantings to attract pollinators of all types! Contact info for the USFWS SD Field Office is also on the website. ENJOY!

[https://www.fws.gov/southdakotafldoffice/Butterfly\\_Garden.html](https://www.fws.gov/southdakotafldoffice/Butterfly_Garden.html)



*The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!' but 'That's funny...'* Isaac Asimov

Science and Engineering Practice: Asking Questions

## Design Challenge 2017—The Great Roller Coaster Challenge register by Mar. 15th



following requirements:

- Use everyday objects and materials from home
- Don't spend more than \$10 on additional materials
- Marble – pick up from the Kirby Science Discovery Center at the Washington Pavilion
- Premade kits are strongly discouraged
- The roller coaster should be mounted on a base that is no larger than 18 inches square
- Roller coasters should be between 12 and 60 inches tall
- Additional points given for including other elements

Build a roller coaster that is exciting, reliable and takes a long time for the marble to travel from start to finish. Your roller coaster needs to meet the fol-

lowing requirements: (see instructions) Presentation and Journal

Each team must document their roller coaster development and construction process in a journal. This can be done in a variety of ways – PowerPoint slideshow, photo display, video diary, notebook...it's completely up to you! Just be sure it lists your materials and explains each stage of the design, construction and testing process.

Teams will have 5 minutes to present their roller coaster to the judges and answer any questions they might have.

Creativity in the journal and presentation is strongly encouraged, and points will be awarded for creativity.



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South Dakota State University

2017

Engaging the Next Generation.

July 23 - July 27, 2017

Participate in the largest conference of its kind that brings together dedicated chemistry educators from across North America. High School and introductory chemistry educators are immersed in an environment where collaboration, support, exchanging ideas and inspiration are expected.

[www.sdstate.edu/ChemEd2017](http://www.sdstate.edu/ChemEd2017)

The 2017 Chem Ed Conference at SDSU is considering additional presentations (abstracts) till March 31. Early Bird Registration for the conference costs \$190 and is open March 15-April 30. Otherwise, the Regular Price Registration is \$300 and is open from May 1-July 9; (Onsite Registration after that.) All info can be found at the below address (or email [Matt.Miller@SDState.edu](mailto:Matt.Miller@SDState.edu) with questions.)

<http://www.cvent.com/events/chemed-2017/event-summary-bbf99b061b5e4114b754db38f021854b.aspx>

## SD—AAPT Photo contest winners

Congrats to Chase McClure - 1st, Emily Bigelow - 2nd, and Ben Hieb - 3rd



## Engineering is Elementary® Teacher Educator Institute

Investigate the basics of the *Engineering is Elementary* curriculum, effective pedagogy, and facilitation strategies to support engineering education in elementary grades through:

- Hands-on experience with 2 EiE units
- Information about all 20 units
- Professional development discussions
- Review of EiE resources
- Sharing your experiences and planning with colleagues



This three-day workshop prepares you to facilitate EiE professional development workshops for teachers in your school, district, or region.



Developed by the Museum of Science, Boston

Teacher Educator Institute—Workshop for Professional Development Providers, at the Science Museum of Minnesota.

**Date:** Wednesday, April 5, 2017 at 8:30 a.m. - Friday, April 7, 2017 at 2:30 p.m.

### To register:

[smm.org/educators/programs-your-school/engineering-elementary/teacher-workshops](http://smm.org/educators/programs-your-school/engineering-elementary/teacher-workshops)

Contact the Science Museum's *Engineering is Elementary* team at [eie@smm.org](mailto:eie@smm.org) or (651) 221-4540 for more information.

**Science Museum of Minnesota**

**SciEd.**

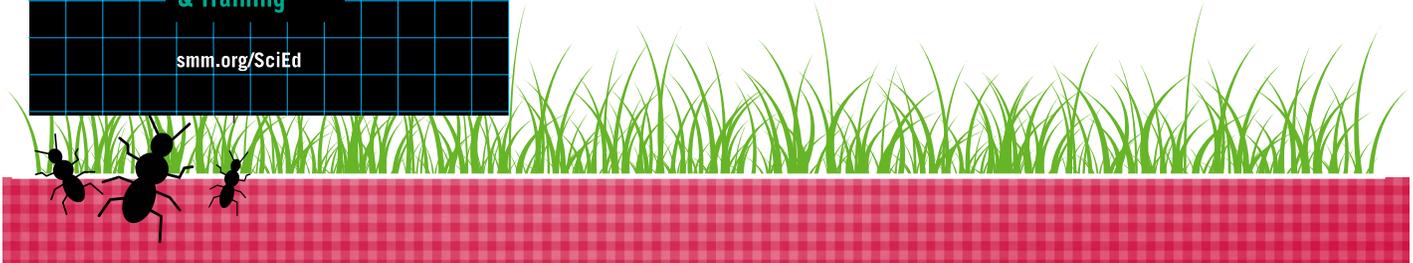
SciEd is science education support and programs for teachers. Working with teachers, we strive to advance science literacy through dynamic resources.

**Field Trips**

**At Your School**

**Resources & Training**

[smm.org/SciEd](http://smm.org/SciEd)



# Computational Astronomy for Teachers and Students

2-DAY COURSE at the South  
Dakota School of Mines &  
Technology campus

Course Offered in April  
2017, October 2017, and  
April 2018

- Earn **1 graduate credit**
- Receive lesson plans
- Tuition is **FREE!**



# Computational Astronomy for Teachers Course [sdsmt.edu](http://sdsmt.edu)

## Introduction:

Today's students live in an age of great space discoveries, and many of them are fascinated by what they hear or read. However, solid understandings of math principles are the building blocks in developing our nation's future engineers and scientists. This project addresses the need to expand STEM education in South Dakota in the field of space science. The result of this effort is expected to be an increase in the number of students interested in learning and understanding mathematics. The goal is to instill in the middle/high school age student the desire to learn and understand mathematics through the exploration of space. The proposed work is in alignment with the new math initiative between the Rapid City School Superintendent and SDSMT's president to boost interest by showing students that math can be engaging, and it can lead to rewarding career.

## Educational Opportunities:

1. Two-day workshops for SD Math and Science Teachers (ED-699, 1cr).
2. September 2017: weekly sessions with night-sky exploration for students and their parents/relatives.
3. Bi-weekly two hour sessions for middle/high school students living in the region served by SDSMT to instill the spirit of exploration of space through understanding applied math in the field.

## NASA Two-day workshops for Math and Science Teachers (ED-699, 1cr):

**April 28-29, 2017      Oct. 6-7, 2017      April 13-14, 2018**

## Logistics:

- Workshops on SDSMT campus in Rapid City; • Earn an educational credit • Tuition is waived for participants
- Teachers will need to make their own housing arrangements • Maximum 15 participants for each workshop

## Description:

Teacher participants will learn about math applications used in astronomy and space exploration, with the goal of being able to use the knowledge in their own classrooms. Through carefully selected material, the workshop will emphasize connections between mathematics and space science.

## Topics Include:

- Kepler's laws, • Computation of planetary masses, • Light speed, • Black holes, • Distances within the solar system and beyond, • Applications to man-made satellites, • An evening of telescopic observations weather permitting.

## Other Opportunities:

### September 2017: weekly sessions for night-sky exploration for students and their parents/relatives.

- Schedule for activities will be listed on the SDSMT website and also advertised through PR office
- Will include hands on activities for students and their relatives and night-sky exploration

### Bi-weekly sessions, for middle/high school students living in the region served by SDSMT to instill the spirit of exploration of space through understanding applied math in the field.

- Apply for Registration at <http://www.sdsmt.edu/ComputationalAstronomy/> | For Questions email: [Donna.Kliche@sdsmt.edu](mailto:Donna.Kliche@sdsmt.edu)

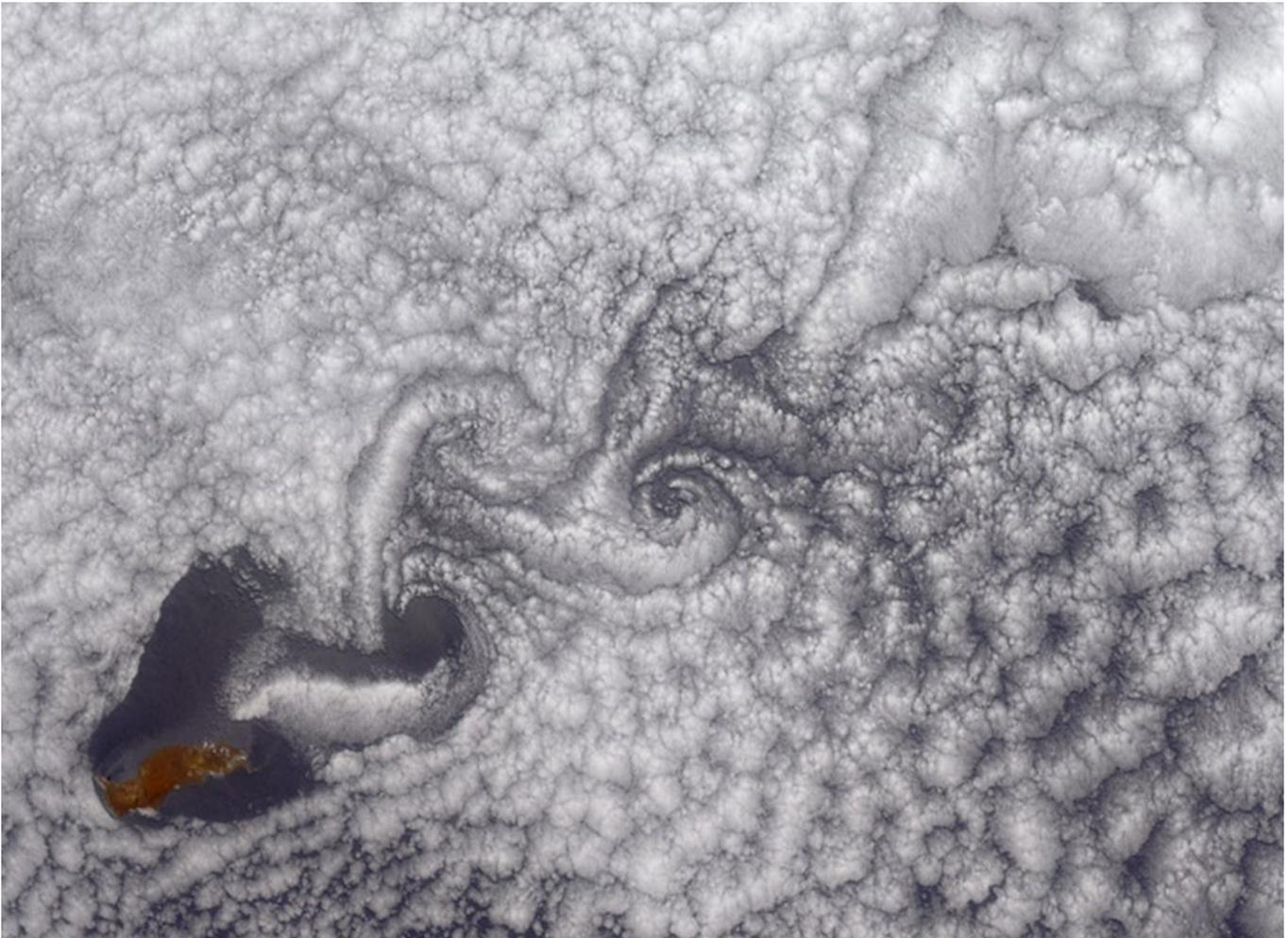




What's new at NOAA/NASA SciJink

## All About Clouds!

All clouds are made up of basically the same thing: water droplets or ice crystals that float in the sky. But all clouds look a little bit different from one another, and sometimes these differences can help us predict a change in the weather. Click on the picture below to learn about some of the most common cloud types you might spot in the sky!    {{ <http://scijinks.gov/clouds/> }}





## Greetings from South Dakota Renewable Energy Association

SD is one of US Department of Energy Wind For School States. The National Renewable Energy Laboratory has provided funding for 2017 REcharge Academy. We have sent two teachers in the past couple of years.

For additional info:

<https://www.facebook.com/groups/1624480984455545>

<http://www.rechargelabs.org/rechargeacademy>

or contact: [wind@pie.midco.net](mailto:wind@pie.midco.net)



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#### PAEMST Contact:

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The SDSTA Newsletter is published four times a year. The March issue (this one) is e-mailed to 130 paid members, and several school science departments. The Membership year in SDSTA starts with the February conference and ends the thirty-first of January. Dues are due at each conference for member discount rates. SDSTA members may give a one year free membership to their student teachers by submitting the student teacher's name & address. One paid conference registration may be given to the SDSTA member that has made a submission to the newsletter (or given a presentation at the conference) and has referred at least three new members. Members may also earn a 10% finder's fee for any science related ads placed in the news-letter. Our rates are \$50 per page (or 3 to 4 quarter pages)

### *SDSTA Membership Form*

Mail to: Deirdre Peck, SDSTA Treas. \$ 5 Student  
 409 S. Kline Street \$ 5 K - 6  
 Aberdeen, SD 57401 \$ 5 Retired  
 \$20 All Others

Name \_\_\_\_\_ Home Phone \_\_\_\_ - \_\_\_\_  
 Home Address \_\_\_\_\_ E-mail \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_ Zip \_\_\_\_\_  
 Your School \_\_\_\_\_ School Phone \_\_\_\_\_  
 School Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_ Zip \_\_\_\_\_  
 Your area K-6 7-8 9-12 College Other \_\_\_\_\_  
 ( circle one )

Referred by \_\_\_\_\_

## Paid Summer Internships for Science Educators at NASA Langley

The Science Directorate at NASA Langley Research Center in Hampton, VA leads several science education programs including GLOBE, MY NASA DATA, and S'COOL. We are looking for several educators to come to NASA Langley this summer and work with our science education team. These internship opportunities are posted through NASA's Intern program: <https://intern.nasa.gov/ossi/web/students/login/>. These positions are open to in-service teachers; educators will need to register on OSSI and apply as a "student". Contact one of the intern coordinators, Christine Dillard, for technical issues registering and applying at: [christine.m.dillard@nasa.gov](mailto:christine.m.dillard@nasa.gov). Summer internships for graduate students or in-service teachers can receive a stipend \$7,500 if interns stay for full 10 weeks. Shorter terms are negotiable.



**Opportunity Title:** *Science Education Intern: Developing Resources for Teachers and K-12 Students in Earth Science*

**Opportunity Post:** <https://intern.nasa.gov/ossi/web/public/guest/searchOpps/index.cfm?solarAction=view&id=17578>

**Internship Location:** On-site at NASA Langley Research Center in Hampton, VA

**Dates:** Applications due March 1, 2017

**Summer Internship:** May 30 – August 4, 2017 (Full time, 40hrs/wk, dates somewhat negotiable)

**Opportunity Title:** *GLOBE Aerosol Campaign Analysis Opportunity for In-Service Teacher*

**Opportunity Post:** <https://intern.nasa.gov/ossi/web/public/guest/searchOpps/index.cfm?solarAction=view&id=16774>

**Internship Location:** On-site at NASA Langley Research Center in Hampton, VA

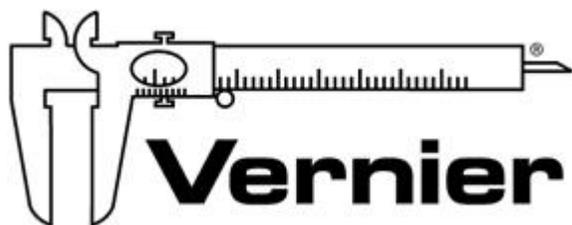
**Dates:** Applications due March 1, 2017

**Summer Internship:** May 30 – August 4, 2017 (Full time, 40hrs/wk, dates somewhat negotiable)



## Vernier Launches New Go Direct™ Sensors with Built-In Wireless and USB Connectivity for Data Collection

*Family of 16 sensors can be used with free Graphical Analysis™ 4 app from Vernier and more than 190 teacher-tested science and STEM experiments*



For more information, visit <http://www.vernier.com>.

# Welcome to Genes in Space™ 2017

The competition that launches your DNA experiment to space!



#GenesInSpace [www.genesinspace.org](http://www.genesinspace.org)

## Become a space DNA pioneer

Propose a DNA experiment to address real-life space exploration challenges like microgravity, radiation, search for alien life, and more.

We invite students in grades 7 through 12 to design DNA experiments for space. Students will pioneer DNA research on the International Space Station to address real-life challenges of deep space exploration. Winners will send their DNA experiment to space! The contest is free, and does not require equipment. Proposals will be judged solely on their creative and scientific merit. Submission deadline is April 21st 2017.

Teachers can turn contest submissions into a [class assignment](#) that's aligned with national standards.

Genes in Space is a partnership between miniPCR, Math for America, CASIS, New England Biolabs, and Boeing.

